

by Abey Ekanayake

Few of us realize the vast quantity of pure water available from rainfall, perhaps because of the speed with which water, the world's most fluid substance, disappears within a very short period of time of it hitting the ground.

With every inch or 25 mm of rainfall a catchment area 50ft by 50ft receives nearly 1,300 gallons or 5,850 liters of water. The average rainfall for Hambantota during the period 1961 - 1990 was 935 mm giving a potential harvest of 48,620 gallons or 218,790 liters of clean water from an area of only 2,500 square feet, in extent. So, with such a potential, why should there be a drinking water shortage?

In drought stricken areas any where in the dry zone, where drinking water is scarce, if we slope the land in a catchment area of 2,500 square feet towards the centre, apply cement or lime plaster or some other weather proofing agent to increase run off, pure water can be collected in a well dug in the centre. See Fig 1:

When you think of rainfall harvesting the following should be considered:

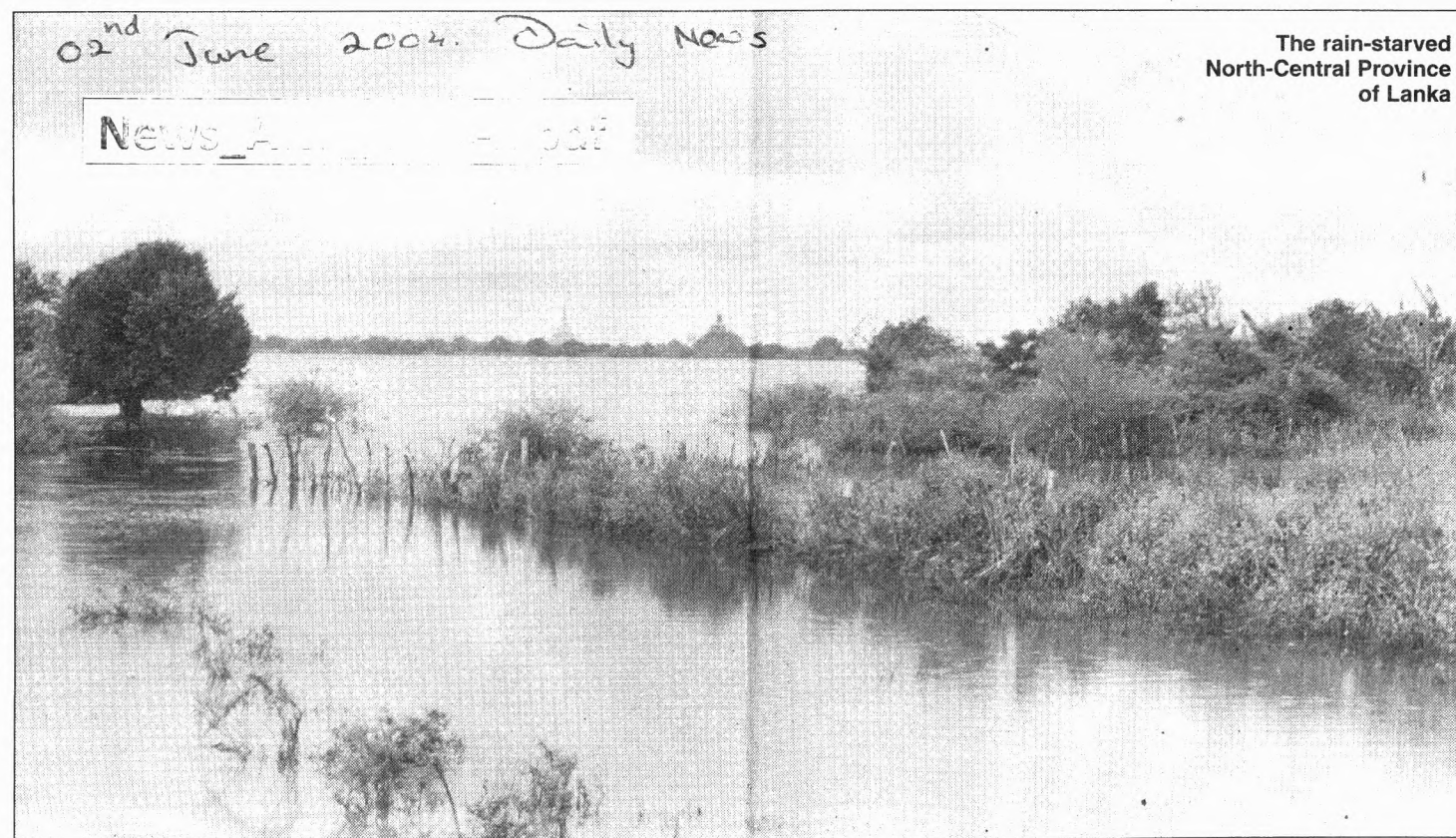
- Hard surfaces like roofs, tarred roads and rocks generate 100% run off.
- Semi hard surfaces like gravel roads, school/house compounds allow 50% runoff.
- Lose catchment areas in the country side 25%.
- Catchment area x Runoff factor x Rainfall - Quantity of water.

If a roof is 20 m long and 10 m wide and the rainfall is 1,000 mm, the water available for harvesting will be $20 \times 10 \times 1000 = 200,000$ liters. All government buildings, especially in the dry zone, should have facilities to collect rain water from the roofs.

A 20 ft diameter by 25 ft deep well can hold over 200,000 liters of water. Considering that the average drinking water consumption to be about 15 liters/day/head, this quantity is sufficient for a village of 100 individuals for about 135 days or four and a half months. Actually the longest period of a drought is about three months.

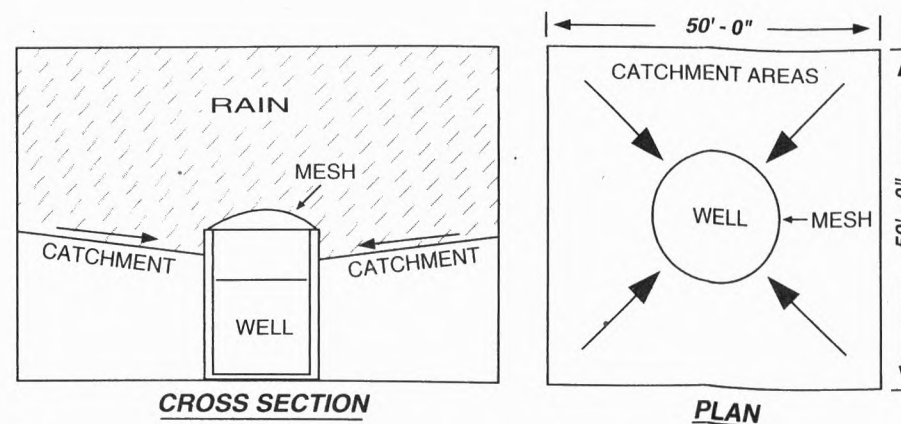
Given the fact that Sri Lanka with the central highlands reaching a height of 2,524 meters is one of the best endowed countries in the world, in terms of average annual rainfall of over 1,800 mm, there is no reason why we should suffer undue hardships from droughts. The wet zone highlands receive an average 4,000 to 5,000 mm of rainfall per annum, whilst the Eastern slopes average is 2,000 to 3,500 mm. Communities living in the lowlands directly below these western and eastern highlands are dependent on the slow release of this abundant supply of rainwater, for their domestic, agriculture, livestock and industrial requirements.

To elaborate, just 25 mm of rainfall on one hectare of land means over 55,000 gallons of water. This means that just one hectare of land in these areas receive between 4 and 11 Million gallons of water per annum. It is therefore very necessary that sound water conservation methods are adopted on these highlands in order to slow down and retain this vast quantity of water and get it to percolate into the soil



The rain-starved North-Central Province of Lanka

Rainfall harvesting and water conservation-vital for national growth



for subsequent slow release in the lowlands rather than allow the water to flow down the slopes and into the sea, almost uninterrupted. It is on these Western and Eastern slopes that most of our tea and rubber plantations are located and they have a tremendous responsibility by the rest of the community as well as for their own benefit, to practice effective water conservation methods. Sound water conservation will not only ensure a continuous supply of water in the low lands but also prevent flash floods and the like.

Any attempt to stop the surface flow or to reduce its speed will allow water to percolate into the soil, where it will be available

for tree growth. The best land use water conservation is forestry. These lands act as a sponge, absorbing the water during the rainy season and releasing it slowly during the dry months. Forestry is the best measure for all highly sloping lands, with slopes over 45 degrees, and land, with thin top soil. Tops of all hills, gravelly and rocky areas not suitable for tea and other crops should be planted in conservation forestry, as catchment areas.

The quickest way to create a catchment or water shed area is to plant *Gliricidia maculata* and or *Dadap* (*Erythrina lithosperma*) sticks at a spacing of about 2m. by 2m. Once these quick growing species have

established *Albizia*, *Kotamba* (*Terminalia Catappa*) and *Kenda* (*Macaranga*) can be planted, followed by high value fruit and timber trees like, Mango, Avacado, Jak, Mahogany, Sapu, Teak etc. Forestation in stages - patience is a virtue to be cultivated in agriculture - it is better to work with nature than try to rush the process.

2ft. x 2ft x 2ft percolation pits capable of holding 50 gallons water in each, should be cut along all estate roads and field path drains, at regular intervals.

Silt pits and bunds should be constructed in all lateral drains so that maximum quantities of rain water are retained in the fields. In lands that have no lateral drains new 2ft. x 2ft. contour drains should be cut. Such methods will hold the rainwater which otherwise will flow into the river within a few hours.

With the adoption these water harvesting/conservation methods, the storage reservoir will be the soil itself, thus mitigating drought periods.

Check dams should be built across the ravines, gullies and small streams to conserve water. Old fertiliser bags filled with soil with the tops stitched and placed across ravines etc. are a cheap and efficient method of making check dams. Check dams should start at the top and work downwards. Either sides of all ravines, gullies and streams should also be planted in conservation forestry, thus

reducing erosion. On many estates water is diverted along road and field path drains to service the irrigation of worker's gardens. As these are generally illegal no precautionary measures are taken to avoid damage to roads erosion etc. It is suggested that such water supply drains be 'regularized' and an effort be made to construct silt pits, percolation pits etc, so that whilst water reaches the cultivators, it also recharges the ground water on its way and there is no damage or erosion.

Over the last few decades there has been a shift in water management. Individuals and communities have steadily given over their role almost completely to the State, even though more than 150 years ago no government anywhere in the world provided drinking water to the community. This practice started in the urban areas and is now spreading to the rural areas as well, as all communities are demanding pipe borne water on the tap. As a result, the simple technology of harvesting rain water has declined and in order to meet these demands we have gone in for large schemes exploiting rivers and ground water through large dams and tube wells. With heavy withdrawals, ground water level are depleting and over extraction from perennial rivers are reported to be causing seawater ingress, as happened recently in the Kelaniya river.

However, a large percentage of the poor in the rural areas still depend on ground-water to get their drinking water and any decline during drought periods poses a serious problem to them. In urban areas the tapping of ground water for drinking purposes are very remote because of the contamination caused by sewage and septic tanks and the only alternative, other than state supplied pipe borne water, is to harvest pure rainwater.

Clean water resources are being viciously affected by pollution and over exploitation, hardly any canal, river or lake near a city today escapes the perils of pollution. The Beira Lake and the Dehiwela canal are good examples of this unchecked pollution.

The other matter that must receive serious consideration of all concerned people is that every school must make a start to harvest roof water so that vegetable cultivation, freshwater fish breeding and fresh water gardens will be a common feature in all schools. Schoolchildren should be made fully aware of the importance of looking after this precious commodity, for which there is no substitute and without which all life will perish.

We should, as a matter of urgency, prepare a concrete plan of action to mobilise the people for rainwater conservation and harvesting.

Water harvesting/conservation should become a mass movement, linking people to their water supplies so as to defuse the impending water crisis. We must realise that there is a looming water crisis, we have had a taste of it in recent times, there is an enormous unmet demand for water - there has been even talk of water taxes and 'privatisation'.

We must also consider the health costs of water pollution, especially among the poor, both in the rural and urban areas. Until a few years ago, no one had heard of bottled water. It is indeed sad that water will soon become more expensive than milk. Is this the kind of economic growth we want?